

Serial No. 10/722,433
Docket No.: P04549-US
CLO.008

REMARKS

An excess claim fee payment letter is submitted herewith for one (1) excess independent claim.

Claims 1-9, 11-17 and 19-20 are all the claims presently pending in the application. Allowable claims 15-17 have been rewritten in independent form. Claims 10 and 18 are canceled without prejudice or disclaimer in the interest of expediting prosecution.

It is noted that the claim amendments herein or later are not made to distinguish the invention over the prior art or narrow the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein or later should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Applicant gratefully acknowledges the Examiner's indication that claims 1-9, 11-14 and 19 are allowed and that claims 15 and 17 would be allowable if rewritten in independent form. Accordingly, Applicant has rewritten claims 15 and 17 in independent form including all the limitations of the intervening claims. Notwithstanding, Applicant respectfully submits that all of the claims presently pending are allowable.

Claims 16 and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kawahata (U.S. Patent No. 5,748,149). Claims 16 and 20 further stand rejected under 35 U.S.C. § 102(e) as being anticipated by Nagumo, et al. (U.S. Patent No. 6,657,593).

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary aspect of the claimed invention, as recited in claim 16, is directed to a chip antenna including a base member including at least one of a dielectric material and a magnetic material, a pattern antenna formed on the base member, a fixed terminal which is formed on a surface of the base member and which is connected to the pattern antenna, and a fixing portion comprising a conductor and which is formed on a mounting substrate and which is connected to the fixed terminal and thereby fixes the base member on the mounting substrate. A frequency characteristic of the chip antenna is adjustable by changing an area of the fixing portion.

When a conventional chip antenna is mounted on a mounting substrate, the frequency characteristics of the chip antenna may be varied by a path pattern, or the like. In such a case, since the frequency characteristics cannot be finely adjusted in the conventional chip antenna, the chip antenna must be replaced with another. Accordingly, it is necessary to prepare many kinds of antennae having frequency characteristics different from each other, thus remarkably deteriorating the productivity of the chip antenna units. (See Application at page 2, lines 17-25)

The invention of claim 16, on the other hand, provides a chip antenna including a fixed terminal which is formed on a surface of the base member and which is connected to the pattern antenna, and a fixing portion comprising a conductor and which is formed on a mounting substrate and which is connected to the fixed terminal and thereby fixes the base member on the mounting substrate, wherein a frequency characteristic of the chip antenna is adjustable by changing an area of the fixing portion. These features, amongst others, provide

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a chip antenna capable of readily adjusting the frequency characteristic thereof by changing the area of the fixing portion. (See Application at page 4, lines 1-5)

II. THE PRIOR ART REFERENCES

A. The Kawahata Reference

The Examiner alleges that the invention of claims 16 and 20 are anticipated by Kawahata. However, Applicant respectfully submits that the reference does not teach or suggest each and every element of the claimed invention.

Kawahata discloses a surface mounting antenna placed on a printed circuit board. (See Kawahata at Abstract)

However, Kawahata does not teach or suggest “*a fixing portion comprising a conductor and which is formed on a mounting substrate and which is connected to [the] fixed terminal and thereby fixes [the] base member on [the] mounting substrate, wherein a frequency characteristic of the chip antenna is adjustable by changing an area of [the] fixing portion,*” as recited in claims 16 and 20.

Rather, Kawahata discloses a surface mounting antenna 10 including a radiation electrode 2, one end of which serves as a ground terminal 8. The ground terminal 8 is connected to a ground electrode 6 on a printed circuit board 4 by soldering or adhesion. (See Kawahata at Figure 1 and column 3, lines 10-18)

The Examiner alleges that the ground terminal 8 of Kawahata teaches the fixed terminal of claims 16 and 20, and that the ground electrode 6 (See Kawahata at Figure 1) teaches the fixed portion (e.g., reference numerals 17a, 17b of the present Application; it is

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noted that all reference numerals used herein are for exemplary purposes only for the Examiner's clarity and not for limiting the claims) of claims 16 and 20.

Namely, the Examiner alleges that a ground electrode 6 in Figure 1 of Kawahata is the same as the fixing portions 17a,17b of the present Application. However, the fixing portions 17a,17b in the present Application are not electrodes for connecting antenna patterns to the ground terminal. Therefore, the fixing portions 17a,17b are completely different from the ground electrode 6 in Figure 1 of Kawahata.

Further, even assuming arguendo that the Examiner's allegations have some merit, Kawahata does not teach or suggest that the area of the ground electrode 6 may be changed to adjust the frequency characteristic of the antenna 10. Indeed, Kawahata makes no reference or suggestion to changing the area ground electrode 6, nor to any benefit of doing so. Clearly, Kawahata does not teach or suggest the fixing portion of claims 16 and 20.

As noted above, the inventions of claims 16 and 20 provides the fixing portion formed on the mounting substrate and connected to the fixed terminal to fix the base member on the mounting substrate, wherein the frequency characteristic of the chip antenna may be adjusted by changing the area of the fixing portion. When a chip antenna is mounted on a substrate, the frequency characteristics of the chip antenna may be altered by the influence of the feeding path or other electronic components. In the inventions of claims 16 and 20, it is possible to adjust the frequency characteristics of the chip antenna, by changing the area of the fixing portions. (See Application at page 9, lines 15-23)

Indeed, Kawahata makes no reference or suggestion to changing the area of any portion or feature formed on the mounting substrate in order adjust the frequency characteristics of the chip antenna, as in the invention of claims 16 and 20.

Therefore, Applicant submits that there are elements of claims 16 and 20 that are not taught or suggested by Kawahata. Therefore, the Examiner is respectfully requested to withdraw this rejection.

B. The Nagumo et al. Reference

The Examiner further alleges that the invention of claims 16 and 20 are anticipated by Nagumo et al. However, Applicant respectfully submits that the reference does not teach or suggest each and every element of the claimed invention.

Nagumo et al. discloses a surface mount type antenna including a loop-shaped fed radiation electrode provided on a substrate, and a non-fed radiation electrode arranged close to the fed radiation electrode with a gap therebetween. (See Nagumo et al. at Abstract)

However, Nagumo et al. does not teach or suggest “*a fixing portion comprising a conductor and which is formed on a mounting substrate and which is connected to [the] fixed terminal and thereby fixes [the] base member on [the] mounting substrate, wherein a frequency characteristic of the chip antenna is adjustable by changing an area of [the] fixing portion,*” as recited in claims 16 and 20.

Rather, Nagumo et al. discloses a surface mount type antenna 1 including a substantially rectangular dielectric substrate 2 that is soldered onto a circuit board 20 through fixing electrodes 7. The surface mount type antenna 1 further includes fed radiation electrodes 3 connected to the signal source 10 through a common fed terminal section 5. A feeding pattern 21 provided on the circuit board 20 connects the fed radiation electrodes 3 to the signal source 10 via the common fed terminal section 5. (See Nagumo et al. at Figure 7c, column 5, lines 45-47, and column 12, lines 3-13)

Indeed, nowhere does Nagumo et al. teach or suggest a fixing portion formed on a mounting substrate connected to the fixed terminal to fix the base member on the mounting substrate, as in claims 16 and 20. As noted, Nagumo et al. merely discloses that the substrate 2 is soldered to the circuit board through the fixing electrodes 7. In fact, there is no mention or suggestion in Nagumo et al. of a fixing portion of any sort formed on the circuit board 20 connected to the fixing electrodes 7 for fixing the substrate 2 to the circuit board 20. Nagumo et al. certainly does not teach or suggest adjusting the frequency characteristics of the antenna by changing the area of a fixing portion, as in the inventions of claims 16 and 20.

The Examiner alleges that common fed terminal section 5 of Nagumo teaches the fixed terminal of claims 16 and 20. The Examiner further alleges that the feeding pattern 21 provided on the circuit board 20 of Nagumo et al. teaches the fixing portion of claims 16 and 20. However, in the invention of claims 16 and 20, the fixing portion formed on the mounting substrate is connected to the fixed terminal to fix the base member on the mounting substrate. Nagumo et al. makes no reference or suggestion to the feeding terminal 21 fixing the substrate 2 to the circuit board 20. As noted above, the substrate 2 is soldered to the circuit board 20 by the fixing electrodes 7. Clearly, Nagumo et al. does not teach or suggest the fixing portion of claims 16 and 20.

Further, the fixing portions 17a, 17b in the present Application are not patterns for feeding an antenna pattern with electricity, as is the feeding pattern 21 of Nagumo et al. Therefore, the fixing portions 17a, 17b are completely different from the feeding pattern 21 in Figure 7c of Nagumo et al.

Notwithstanding, even assuming arguendo that the Examiner's allegations have some merit, Nagumo et al. certainly does not suggest that the feeding terminal 21 may be connected

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to the fixing electrodes 7 to secure the substrate 2 to the circuit board 20. Nor does Nagumo et al. teach or suggest changing the area of the feeding pattern 21 in order adjust the frequency characteristics of the surface mount antenna.

Indeed, as noted above, when a chip antenna is mounted on a substrate, the frequency characteristics of the chip antenna may be varied under the influence of the feeding path or other electronic components. In the invention of claims 16 and 20, the frequency characteristics of the chip antenna may be adjusted by changing the area of the fixing portions. (See Application at page 9, lines 15-23)

Clearly, Nagumo et al. does not teach or suggest a fixing portion comprising a conductor and which is formed on a mounting substrate and which is connected to the fixed terminal and thereby fixes the base member on the mounting substrate, wherein a frequency characteristic of the chip antenna is adjustable by changing an area of the fixing portion, as recited in independent claims 16 and 20

Therefore, Applicant submits that there are elements of claims 16 and 20 that are not taught or suggested by Nagumo et al. Therefore, the Examiner is respectfully requested to withdraw this rejection.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 1-20, all the claims presently pending in the application, are patentably distinct over the prior art of record and are allowable, and that the application is in condition for allowance. Such action would be appreciated.

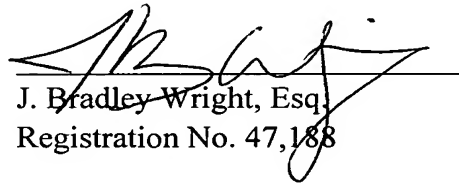
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Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned attorney at the local telephone number listed below to discuss any other changes deemed necessary for allowance in a telephonic or personal interview.

To the extent necessary, Applicant petitions for an extension of time under 37 CFR §1.136. The Commissioner is authorized to charge any deficiency in fees, including extension of time fees, or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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